THE

January, 1961

CHEMIST

VOLUME XXXVIII NUMBER 1

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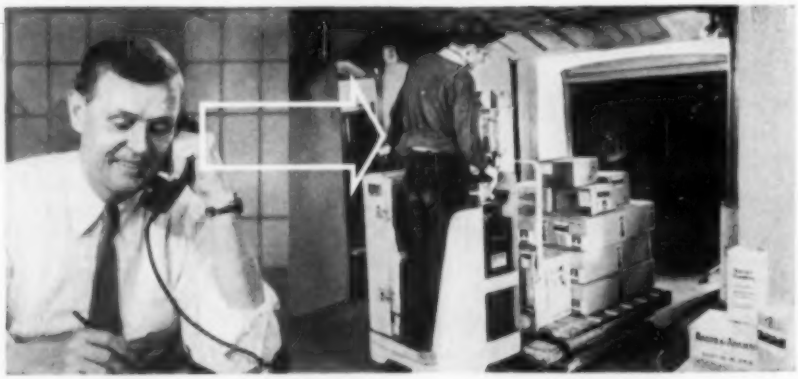

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Deadlines for THE CHEMIST: For the February issue the deadline is Jan. 15.

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To Come in February

The Niagara AIC Chapter has made available a paper, presented before it by P. F. Casella, manager, Patent Department, Hooker Chemical Corp., on "The U. S. Patent System." . . . Dr. Jack P. Montgomery, Hon. AIC, is the first to respond to Dr. Eisenschiml's desire to see a paper on the responsibility of the public to scientists . . . Dr. Max Bender will report on the interesting panel discussion, "The Working Chemist and Professionalism" held by the North Jersey Section of the ACS.

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EDITORIAL

Prophetic Words

FORETELLING the future has been, since ancient times, associated with the welcome given to a New Year. Few have been so prophetic as the late Harrison E. Howe, who wrote for *The New York Herald* in 1921 an article entitled, "What Science is Doing to Better Human Living," and subtitled, "Research Workers Improving Everything from Carburetors to Food and Studying Problems of the Source of Energy that May Transform the World." Here are some excerpts:

> "The present widespread public interest in science . . . can hardly be maintained unless Mr. Average Man can be brought to think of fundamental and applied science in terms of what it means to him. He wants an easier, more comfortable life safeguarded as to health and property and at what he calls a reasonable cost. He, therefore, becomes interested in science when it seems to afford him things to eat and wear . . . improved transportation, widely extended, easy communications, curative drugs, things to hear and see and feel. To appreciate what underlies such achievements is quite another matter . . .
>
> "The one big problem of today is energy—how to make it available in ever large quantity, how to use it to best advantage and where to find new sources of energy . . . So long as atoms were considered the ultimate unit and the smallest conceivable subdivision of matter no one thought of possibly deriving more energy than is to be had by the step from the molecule to the atom.
>
> "But this is changing. Through research on atomic structure . . . we have come to know that the atom is composed of many parts . . . Scientists believe that from atomic dissociation could be derived such vast quantities of energy that our whole civilization would be changed, and one of them has said that man will some day date his accomplishments from the discovery of how to use the energy bound up in the atom . . .
>
> "The future will see a greater use of some of the lower forms of life to do work for men. Chemists have learned how to utilize several forms of bacteria, notably in processes for making grain alcohol from wood waste and corn cobs and fermentation methods for acetone . . ."
>
> "(A) line of research in progress which seems certain to yield results of the most importance to man is mainly the task of the chemists, and concerns that difficult fight upon pathogenic organisms within the human body. The several points of similarity between the two organisms make it no easy thing to destroy the one without injury to the other. Add to this the handicap imposed by the extremely sensitive balance within the body and we see how bold is the chemist in attacking the problem at all . . ."

We endorse for this second New Year of the Exciting Sixties, Dr. Howe's summary sentence:

> **"Whatever may appeal to you as the outstanding unsolved problem of the future, you may count on it chemists will have a part in the solution."**

The Metropolitan Microchemical Society, under the sponsorship of the International Union of Pure & Applied Chemistry, will hold an International Symposium on Microchemical Techniques, Aug. 13-13, 1961, at Pennsylvania State University. For information: Howard J. Francis, Jr., c/o Pennsalt Chemicals Corp., P.O. Box 4388, Philadelphia 18, Pa.

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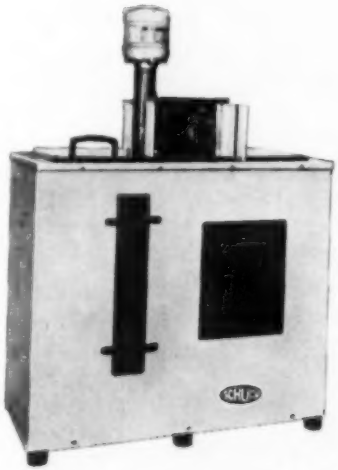

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Special AIC Announcements

Science Writer to be Honored

The Honor Scroll of the Twin City AIC Chapter will be presented to Victor Cohn, science writer for the *Minneapolis Star and Tribune,* at a meeting of the Chapter to be held January 31, 1961, in Minneapolis, Minn. Those who attended the 37th Annual AIC Meeting will remember Mr. Cohn's address on "The Chemist and His Country."

Meeting of National Council

The next meeting of the AIC National Council and Board of Directors will be held Feb. 9, 1961, at The Chemists' Club, New York 17, N. Y. Chapters, Committees, or individuals who wish to submit special matters for consideration at this Council meeting should send them to the AIC Secretary to arrive at least two weeks before the meeting, for inclusion in the general agenda. (Applications for membership, however, should be sent to arrive by January 9.)

Deadline for AIC Membership Applications

The deadline, for receipt of AIC membership applications to be acted upon at the February 9, 1961, meeting of the National Council, is January 9, 1961. Please send applications to The Secretary, THE AMERICAN INSTITUTE OF CHEMISTS, 60 E. 42nd St., New York 17, N. Y.

New Dress for the New Year

THE CHEMIST will have new typography, a new layout, and a new cover, thanks to the cooperation of Richard L. Moore, F.A.I.C., chairman of our Committee on Public Relations. Advance proofs of the new form have been prepared and as soon as mechanical details have been worked out, THE (new) CHEMIST will be ready for your inspection and comment. We hope you will like it.

The American Institute of Physics, the Instrument Society of America, and the National Bureau of Standards are sponsoring a Symposium on Temperature: Its Measurement & Control in Science & Industry, Mar. 27-31, 1961, at Columbus, Ohio. For information: V. W. Sikora, ISA, 313 6th Ave., Pittsburgh 22, Pa.

Leading paper companies have established the Syracuse Pulp & Paper Foundation, Inc., to help gifted science students, who choose the paper industry for a career, to obtain their education at the New York State college of forestry at Syracuse University, Syracuse, N. Y. Scholarships, grants, or non-interest bearing loans will be made. The president of the Foundation is Robert F. Vokes, vice president of Black-Clawson Co., Middletown, Ohio.

Industrial Chemistry: 1935-1985

Mike Baker, F.A.I.C.

President, m. h. Baker Co., 109 Portland Ave., Minneapolis 1, Minn.

(A condensation of a paper presented before the Division of History of Chemistry of the American Chemical Society, in New York, N. Y., Sept. 13, 1960)

IF we were to transport ourselves backwards in time to 1935, we would discover that our lives, including our activities in the chemical industry, had changed radically in many ways.

In our daily lives, in 1935, the only synthetic fiber available was rayon. Nylon, Orlon, Dacron and the others still had to be engineered. Phosphors were not in use for general illumination, and there were few fluorescent lights. There were no chemotherapeutic agents of significance, nor had the notion of such agents advanced beyond the dream stage. The exotic fuels necessary to drive airplanes at their present supersonic speeds had not yet been assigned laboratory status. Rockets were chiefly in science-fiction stories. Few believed that the atom could be split.

There were no supermarkets in 1935. The whole idea of prepackaged foods, whether dry, liquid or otherwise, had yet to be developed. Food technology was largely confined to the canning process. Frozen foods had not been developed commercially. There were few cake mixes or other pre-packaged combinations of convenience foods.

Liquid detergents had not appeared and soap was still king. Alkyd resins were new and the preferred ingredients for making paint were linseed oil and lead. Automobiles came in two colors, mostly black. There was little consumer demand for multi-shaded colored paints and pigments. Plastics were few with limited properties. Adhesives were mostly of animal origin. The chemist had not thought to use, in adhesives and coatings, the synthetic resins he was beginning to make.

These few examples develop the point that we have indeed advanced in the application of chemicals in industry in the past 25 years. This is what the industrial chemist has been doing this quarter-century.

Had I predicted, 25 years ago, that the atom would be split and that this would lead to an entirely new chemistry and chemical engineering, to a

new world; that fluorochemicals would be developed into a branch of chemical endeavor closely rivalling the organic chemistry of carbon; that we would use widely the cooler illumination obtained through the excitement of phosphors; that we would have a completely new branch of chemical endeavor, called "Food Technology," or that the formal field of chemical engineering education would change from the then "industrial chemistry," based on education in unit process, to unit operations emphasis and finally, as now seems to be happening, to determination of rate-change, I would have been considered a crackpot.

Had I talked about the development of a synthetic fibers industry and how its development would bring about, as a by-product, strong sociological changes in the Southland, I might have been hooted off the platform. Yet all these things and more have happened. The world has been changed by developments in process chemistry.

With this as preamble, I can now make the wildest possible predictions with complete assurance. I am certain, however, that my projections will be conservative, because, as truth is stranger than fiction, so it is wilder than most individuals' imagination in the way it unfolds.

These projections are not drawn from a hat. Market research techniques have also developed over these past 25 years to where they are being used quite successfully by most chemical organizations to project the possible future of new products. Market research is also being used to estimate the trend of prices, sales, availability of personnel, and many other things, statistically, to serve as guidance for future activity. Market research has been described as "educated guesses based on statistical data collected by the Department of Commerce." My projections are offered as "educated guesses based on a reading of the recent history of chemistry"—and a reasonable understanding of chemical technology.

The sea is full of minerals and other wealth which has yet to be exploited. It would be much less expensive to get our minerals, including those we consider cheap, from the sea through newly developed electrically-based refining methods. Admiral Strauss, formerly of the Atomic Energy Commission, once predicted that because of the availability of cheap energy due to the liberation of energy from the atom, "power will be so cheap that we will hardly bother to meter it by 1975."

Whether it is so-called atomic power, solar-derived power, or power derived from the energy layers surrounding the atmosphere, power will indeed be so cheap by 1985 that we will certainly have developed an electro-chemical refining industry to get our metals from the sea. Our new metallurgical industries will be lo-

cated near the sea coasts and we will use as materials of construction the light metals that are derived easily from sea water.

Demands for high energy fuels have driven us to using boron and other elements. It is now easy to predict that our future fuel requirements will be met largely from the use of water, solar energy, or metal-oxygen combinations as raw materials.

Many chemists will be working on the samples of chemical, biochemical, metallurgical and I-don't-know-what-other-kinds of specimens taken from the surface of the moon and other heavenly bodies. Undoubtedly we will be sampling these bodies within the next 25 years. We will also be developing technology for the re-use of animal wastes and for production of concentrated, high-energy, low-mass fuels, including human foods, for use in making space travel more safe, comfortable, and certain.

Should our population continue to increase at the explosive rate it is now following (and this seems likely unless another possible controlling projection, such as world government, should take place politically before 1985), we can expect that the chemist who is now the food technologist will have successfully developed purely synthetic foods and new food preservation methods. Irradiation is now being pioneered; other things will follow. By 1985 many protein syntheses will have been developed commercially, and oxygen, carbon, sulfur, and nitrogen will be used to make the protein foods we need. Perhaps they won't be quite cheap enough by 1985, but one can bet on the ingenuity of the biochemist and the chemical engineer to bring about a good part of the technological knowledge which can develop this industry.

At the same time we will be growing cheap natural foods, such as our old friend *Chlorella,* under controlled conditions in highly concentrated, small regional factories, and we will feed this green little giant, which is full of energy and vitality, to many peoples. Foods will have to be able to travel at high speeds, be packaged to last long times, and be prepared *rapidly*. They will fit into the high speed, ultrasonic, high-frequency, high-energy, heating and cooling devices which we will use for cooking and cooling. We will tenderize our meats through ultrasonic methods, breaking down the fibers as necessary —and we will probably "age" our whisky in the same way!

We will understand more about the creation of life by 1985, and if we can make protein foods, there is undoubtedly going to be some related work done on the recasting of human form or life in order to prolong it. I am not predicting that we will be making synthetic human limbs, but I don't discount it as a possibility. We will improve life's quality and perhaps

control to an extent human reproduction.

The atomic scientist working in applied chemical physics and physical chemistry will have learned much more about what he can do with irradiated materials, isotopes, and so on. It is safe to predict that we will have developed many interesting new ways to run chemical analyses, perhaps by introducing newer simple tracer devices and other chemical and physical phenomena into our analytical procedures—as is already being done. I predict much more highly refined devices. Remember that chromatography was not even thought of as a commercially applicable device in analytical procedures 25 years ago, even though it was mentioned in the literature over 100 years earlier.

With new metallurgy a certainty, we will have denser, tougher metals and plasto-metals which will enable us to build pressure vehicles withstanding much higher pressures than now. There will be new and interesting rearrangements in the polymer area. These will also be developed to withstand higher temperatures. New liquid plastics and tough metal-like plastics will be available, revolutionizing paint technology thoroughly. Have you noticed, incidentally, that only recently someone produced liquid polyethylene, material that stays liquid until it is wanted in solid form?

Organic chemistry will not be based only on carbon. I mentioned fluorine; there are other active elements about which a whole new branch of chemistry will be built.

Having excited your imagination, I hope you can go on from here. My projections, however, are based on a presumption . . . of a world at peace.

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Basic Chemical Research Required to Conquer Senility

Johan Bjorksten, Ph.D., F.A.I.C.

Bjorksten Research Foundation, 2405 Norfolk St., Houston 6, Texas

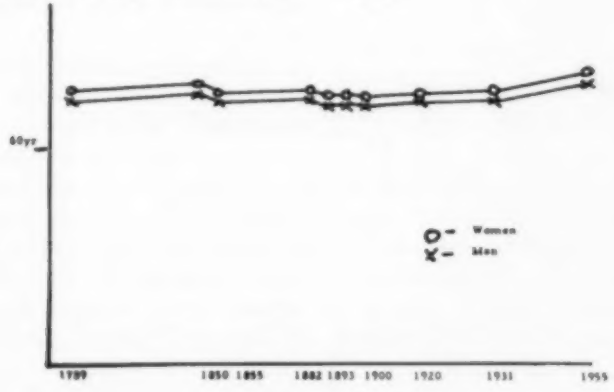
(Conclusions after reviewing the "Background Paper on Research in Gerontology: Medical," which was issued in connection with the White House Conference on Aging.)

THE White House has called a Conference on Aging for January 9-12, 1961. This is indeed a laudable enterprise. We hope that more than a start will be made to understand this subject.

However, the "Background Paper on Research in Gerontology: Medical," provided for this phase of the Conference, is disappointing. The present agenda shows lack of realization that the essential requirement for sound progress, in research or otherwise, is a firm foundation of basic facts. The report is overly concerned with the advanced symptoms of aging. It shows no attempt to resolve different views of aging's basic mechanisms. To proceed without such knowledge is like trying to build a house without a foundation.

The breakthrough, which is long overdue, requires the attention of new minds and new methods.

While spectacular progress has been made in the conquest of infant mortality and in the infectious diseases of middle age, no appreciable advance has been made in the conquest of senility. The life expectancy of a person at 60 is now only within a couple of years of what it was in 1789, and even this slight gain in recent years is mainly traceable to antibiotics and not to any progress in aging.

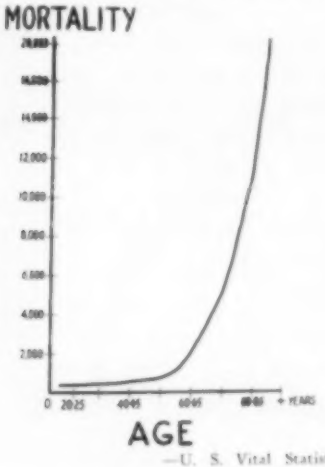


Life Expectancy at Age 60

—From Metropolitan Life Insurance Co., *Historical Statistics*

Why this singular lack of success? Almost all of the work discussed in the background paper deals with the late, end results of aging. But aging must be controlled before these changes have become irreversible. Degenerative disease should be forestalled; an understanding of the aging reactions should be clear, so that we can forestall the development of degeneration.

The following curve shows the number of deaths per 100,000 persons per year in age classes from 15-85.



—U. S. Vital Statistics

Since hazards are roughly in the same order of magnitude each year, the curve actually shows the decline in resistance to all stresses, which is the characteristic of aging. Thus, persons who may be saved from dying of circulatory disease at, say, 85, would merely be saved for a progressively weak and precarious existence and would die a few years later of perhaps a common cold or influenza, as by that time their resistance would have declined to the point where even the slightest ailment is fatal. In the 139 pages of the background paper, not a single constructive thought could be found concerning the decline of resistance to stresses, which is the most general and dangerous common symptom of all aging.

For the chemist, a consideration of the shape of the mortality curve will suffice to show that the main effort should be directed to the change of the shape of the curve, not just its position—a determination and control of the influences which bring about the disastrous upward bend.

The entire thinking and line of attack in the background paper are directed to correcting the situation *after the fact*, when resistance to all stresses has declined to a small fraction of what it was in vigorous middle life.

An explanation of this lack of realization of what to a chemist would be obvious is found when the qualifications of the committee members are reviewed. They are eminent specialists on the treatment of far-advanced degenerative diseases. There is not a single chemist among them.

However, the great advances that are being made in medicine are more often than not the result of the teamwork of chemists and medical men. And the breakthrough in aging, which

beyond question begins with chemical reactions, will almost certainly stem from chemical discoveries.

Therefore, three or four chemists added to this committee would, no doubt, have produced an altogether different document; a report that could have been the basis for a genuine breakthrough on the fundamental plane. The report, moreover, does not even recognize the importance of the basic question, "What is aging?", nor suggest a single thought that might be helpful in seeking a direct answer to the question, "How could aging as such be controlled?"

We have among us many distinguished men who could have contributed immeasurably to such a report, and who, no doubt, would have been available: Not specialists in aging, but men who are skilled in extracting the essential from a mass of data, in planning meaningful experiments, in effecting breakthroughs; men like, for example, Farrington Daniels, Charles A. Thomas, Waldo Semon, Glenn Seaborg, James B. Conant, Amos Horney, Henry Hass, to mention but a few.

In summary, the whole report is a continuation of a line of diffuse collection of data on extreme symptoms of far-advanced deterioration. This attitude can lead to no breakthrough, despite large expenditures of time and money. The answer to the aging problem demands attention to the underlying chemistry.

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The preliminary program for the 1961 ACHEMA Chemical Engineering Congress and Exposition to be held in Frankfurt, Germany, June 9-17, 1961, is available from the American Chemical Society, Chicago Section, 86 East Randolph St., Chicago 1, Ill.

ART

Understanding it) The learned understand the theory of
Appreciating it) art, the unlearned its pleasure.

—Marcus Fabius Quintillianus
(*circa* 40-100 *AD*)

Its Parents: The mother of the practical arts is need; that of the fine arts is luxury. The father of the former is intelligence and of the latter genius, which is itself a kind of luxury.

—A. Schopenhauer
(1788-1860)

"Science is the Essence of Today's Culture"

(Excerpt from an address by Dr. Hans A. Bethe, professor of physics, Cornell University, presented before the New York State Citizens Committee for the Public Schools, Rochester, N. Y., Nov. 11.)

SCIENCE is an adventure of the mind. It is the field of human mental activity which has made by far the greatest advances in the past 100 (also 300) years. It is not only mastery but also understanding of nature, quite undreamed of by the ancients (though they were interested in understanding nature) or by men in the Middle ages.

The turn of science in the last 60 years, entirely unexpected by earlier science, has been away from "materialism," often contradicting our sense impressions. Very exciting to the scientists, and only most vaguely guessed by even the educated layman, science is the essence of today's culture, as painting and other fine arts were of the Renaissance, or political thought of the 18th century. It is most regrettable that the public does not participate in this adventure and is essentially illiterate in science.

We need science education to produce scientists, but we need it equally to create literacy in the public. Man has a fundamental urge to comprehend the world about him, and science gives today the only world picture which we can consider as valid. It gives an understanding of the inside of the atom and of the whole universe, of the peculiar properties of the chemical substances and of the manner in which genes duplicate in biology. An educated layman can not contribute to science but can enjoy and participate in many scientific discoveries which are constantly made. Such participation was quite common in the 19th century but has unhappily declined. Literacy in science will enrich a person's life.

Science for the educated layman is also a practical necessity. In business and politics, and also in daily life, he will often have to make some decisions involving scientific and technological matters. A person who understands what scientists talk about can form his own judgment and will not be over-awed by crackpots who promise the sky. People should not close their minds by saying, "This is science so I can't understand it."

Godfrey L. Cabot, Inc., Cabot Carbon Co., Cabot Shops, Inc., and Cabot Gasoline, have been merged into Cabot Corporation, 125 High St., Boston 10, Mass.

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On Licensing

Karl M. Herstein, F.A.I.C.

President, Herstein Laboratories, Inc., 44 New Street, New York 4, N. Y.

BETWEEN thirty and thirty-five years ago when THE AMERICAN INSTITUTE OF CHEMISTS and the writer were both a great deal younger, the latter was quite certain that licensing would solve most of the professional problems of the chemists. In the intervening time, the writer has come to the firm conviction that for the overwhelming majority of chemists licensing has no significance.

What licensing amounts to is a statement by a governmental body that the possessor of the license has been examined more or less thoroughly as to his technical qualifications and surely even less carefully as to his professional responsibility. Such a statement is only of concern to the unattached member of the general public who has occasion to employ the services of the licensee. This only happens in the case of consultants who offer their services to the unattached public. Any one in the educational field or in the chemical industry has much sharper tools for investigating the qualifications of the prospective employee, and, unless he belongs in an institution for the feeble minded, will avail himself of them.

Sometimes also, certification is discussed in terms similar to licensing. In general, certification has the same meaning as does licensing except that it is performed by a non-governmental body selected by choice of the profession at large. The same considerations which negate the value of licensing to advance the professional status of the majority of chemists apply equally to certification.

The plain fact is that the majority of chemists have no contact with the public-at-large in their professional capacity. Everyone sooner or later needs the services of a physician or a plumber, so it is quite right that the State should attest that those who proffer themselves in these capacities are suitably qualified. The vast majority of chemists work for organizations and their qualifications are of direct interest only to their employer. Therefore, neither licensing nor certification are pertinent.

The Fiber Society will hold its Spring Meeting on April 27-28, 1961, at the Georgia Center for Continuing Education, Athens, Ga.

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How Small Chemical Businesses Can Reduce Taxes by Making the Election to File as a Subchapter S Corporation

Richard O. Bertoli

R. O. Bertoli and Company, 7520 Bergenline Ave., North Bergen, N. J.

SINCE the 1958 Technical Amendments Act was passed, closely held small businesses have been asking, "Will we save taxes by making the election to file as a Subchapter S Corporation (corporation taxed as a partnership)?"

The answer is "Yes" in the majority of cases, if the company meets the qualifications of the act. Let us look at what a Subchapter S Corporation is.

Under the 1958 act, a corporation, with the consent of all of its stockholders, can elect not to be taxed on its income. Instead, the stockholders holding stock at the end of the Corporation's taxable year report their pro-rata share of the company's income. Thus, the owners obtain the benefit of limited liability while eliminating double taxation.

In order to be eligible to file under the Act, a corporation must meet the following qualifications:

(1) It must not have more than 10 stockholders.
(2) It must be a domestic corporation.
(3) It must not be a member of an affiliated group eligible to file a consolidated tax return.
(4) It must not have more than one class of stock outstanding.
(5) It must not have a non-resident alien as a stockholder.
(6) It must not have a stockholder who is not an individual, such as a corporation or trust.

Companies making the election gain the benefits of:

(1) Eliminating double taxation on corporate income.
(2) Reducing taxes by dividing income among the family, accomplished by giving stock to children of present shareholders.
(3) Deferring taxes on income by electing to file on a fiscal year basis.
(4) Applying corporate losses against personal income.
(5) Applying personal losses against corporate income.
(6) Eliminating double taxation resulting from disallowance of travel and entertainment expenses.
(7) Eliminating the disallowance of excessive officer-stockholder salaries.
(8) Eliminating the accumulated earnings tax.

To determine whether to make the election, a careful analysis should be made of the tax status of the corporation and its stockholders as it is now and how it will be in the future.

New corporations should make the election, since they will probably lose money in their first few years. The losses will be offset against the stockholders salaries and outside income for tax purposes and thus offset the effect of the loss.

Some tax consultants, who lack imagination, argue that companies which wish to accumulate earnings for future expansion should not make the election. I disagree. The tax benefits by making the election and the ac-

cumulation of capital can be done simply by distributing the earnings to the shareholders and having them reinvest the amounts distributed by purchase of additional stock.

Companies that distribute the major portion of their income as dividends should make the election regardless of the tax bracket of the stockholders. Look at the savings to a stockholder in the individual maximum tax bracket of 91%:

	Regular Corporation	*Electing Corporation*
Corporate Income	$30,000	$30,000
Corporate Tax	10,100	———
Income available for dividend distribution	$19,900	$30,000
Tax to shareholder	$18,109	$27,300
Total Tax	$28,209	$27,300

If a 91% stockholder will save taxes by making the election, how much would you save?

Let us look at a few examples and compare the total tax of a regular corporation and an electing corporation. Examples are based on the assumption that each corporation has three stockholders drawing salaries of $10,000 each, all stockholders are married, filing joint returns, and they have no other dependents or outside income.

	A		B	
	Regular Corporation	*Electing Corporation*	*Regular Corporation*	*Electing Corporation*
Corporate Income	$15,000	$15,000	$30,000	$30,000
Stockholder salaries	30,000	30,000	30,000	30,000
Stockholder Tax	4,908	8,880	4,908	13,596
Corporation Tax	4,500	———	10,100	———
Current Tax Cost	9,408	8,880	15,008	13,596
Earnings taxable later	10,500	———	19,900	———
Future Tax @ 25%	2,625	———	4,975	———
Total Tax Cost	$12,033	$ 8,880	$19,983	$13,596

	C		D	
	Regular Corporation	*Electing Corporation*	*Regular Corporation*	*Electing Corporation*
Corporate income	$60,000	$60,000	$120,000	$120,000
Stockholder salaries	30,000	30,000	30,000	30,000
Stockholder Tax	4,908	25,302	4,908	57,006
Corporation Tax	31,200	———	56,900	———
Current Tax Cost	36,108	25,302	61,808	57,006
Earnings taxable later	28,800	———	63,100	———
Future Tax @ 25%	7,200	———	15,775	———
Total Tax Cost	$43,308	$25,302	$ 77,583	$ 57,006

Now that you have seen the savings available in the above examples, compute the amount you would save by analysing your own tax position. If taxable income to the individual does not exceed $170,000 then a savings is available.

Making the election facilitates the division of income among members of the family. Bona fide gifts of stock to members of the family will spread the corporate income into the lower tax brackets of the children of present stockholders. The dependency exemption will not be lost if the children are under 19 years of age or are full time students.

The opportunity to control taxable income is of major importance when considering making the election. By adopting a fiscal year ending January 31, the shareholders can decide in December whether to distribute income in that year or wait until January and pay a tax in the following year. As much as 11 months tax can be deferred for a full year by using this method.

Congress has passed the Act to benefit qualifying corporations. Now, it is up to the individuals concerned to accept or reject the benefits available.

Arthur D. Little, Inc., Acorn Park, Cambridge, Mass., has appointed Dr. Howard O. McMahon as senior vice president.

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Newark College of engineering announces the degree of Doctor of Engineering Science in Chemical Engineering and in Electrical Engineering. For information: Dr. Irving P. Orens, Chairman, Graduate Division, Newark College of Engineering, Newark 2, N. J.

The New York Section of the Society for Applied Spectroscopy will meet at 8 p.m., January 10, 1961, at Stevens Institute of Technology, Hoboken, N. J. Speaker: Dr. Friederich H. Reder, U.S.A. Signal Research & Development Laboratory. Subject: Application of Atomic & Molecular Resonance Phenomena for Frequency and Time Control.

TAPPI is holding its 46th Annual Meeting, Feb. 20-23, 1961, at the Hotel Commodore, New York, N. Y.

For the Cause of World Peace

(Excerpts taken from the acceptance address of Hans Stauffer, president of Stauffer Chemical Company, when he received the 1960 Chemical Industry Medal of the American Section of the Society of Chemical Industry.)

THE under-developed nations of the world — and particularly those whose independence has been recently achieved — are destined to play an increasingly important role in world affairs. In those countries of Asia, Africa and South America, millions of people lack adequate food, clothing, housing and medical care . . .

This is the challenge to the chemical industry of the Western world—to use the great scientific advance achieved by our industry to eliminate or alleviate the pressures of hunger and human want . . . by sending the roots of our chemical technology, capital, and human resources to these countries, just as Europe did to the United States 150 years ago.

Never before in the history of the world has the opportunity been presented so directly to one segment of our industrial society to make a real contribution to world peace. With all due respect to the other great industries of our economy . . . none . . . can individually meet the basic personal needs of millions of people . . . as directly and effectively as can we with our chemical tools.

In the underdeveloped areas, hunger increases daily with mounting population pressures. For example, India, a key country in the neutral bloc, already underfed, must increase its food grain production by 55% by the end of 1966 merely to keep pace with its population growth—an almost impossible task. Through the application of chemical fertilizers, however, productivity from existing crop lands in India and elsewhere can be greatly increased and many barren soils can again be made fertile.

Chemical insecticides and weed killers can increase and protect vital food crops. (In 1958, in Ethiopia, locusts destroyed enough food crops to feed nearly a million people.)

We can make fibers synthetically from abundant chemical raw materials not dependent upon the soil or weather, and thereby free much needed land for food production.

We can utilize nuclear energy to generate power in those areas where coal and oil are lacking.

We can make plastics cheaply and in volume to replace wood and steel in housing and other construction.

Finally, with an ample supply of effective drugs, much of the disease and suffering which still afflict many peoples of the world can be eliminated.

If our chemical industry will move boldly into the under-developed areas with its technology, capital and hu-

man resources, I am convinced that the Russians will be unable to meet this competition . . . Khruschev himself concedes that the Russian chemical industry is substantially behind that of the Western world, particularly in such areas as synthetic fibers, plastics and pharmaceuticals . . . We must take advantage of our present lead to demonstrate to the world what the initiative and vitality of a free society can do to produce scientific advances for the benefit of all mankind. If we are equal to this great challenge, our industry can strike a mighty blow for the cause of world peace.

The Work of Chemists

William F. Martin, F.A.I.C., **Robert C. Watson,** F.A.I.C., **Raymond Nelson,** F.A.I.C., and **Maynard J. Pro,** F.A.I.C., are the subjects of photographs in an article "They Get Paid to 'Drink' on the Job," in the *Sunday News,* New York, N. Y., (Oct. 9, 1960).

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Dr. Paul Block, Jr., F.A.I.C., publisher of *The Toledo* (Ohio) *Blade,* speaking to the Graduate Faculties Alumni of Columbia University, New York, said:

> "American newspapers, as a rule, report as news what they know will interest their readers. It is the editor's task to keep a step ahead of his readers, giving them a little more science news, or national news, or foreign news than they want. Most editors try to do this but they can't move too far ahead because the readers resent change in content or format of the papers they have read all their lives."

Technical Operations, Inc., Burlington, Mass., recently demonstrated an advanced technique which simulates radioactive fallout on residential homes and public buildings as it would result from a nuclear attack. The technique was demonstrated with a small scale-model, 2-story home, and a sealed radioactive source containing 10-curies of cobalt-60.

Reprint Requests

The Florida Power Corp., St. Petersburg 1, Florida, has been granted permission to reprint the article, "Personal Responsibilities of Professional People," by Andrew H. Hines, Jr., which appeared in the October issue of THE CHEMIST.

The *Mellon Institute News, The Blue Pencil* (bulletin of the Pittsburgh Chapter, Society of Technical Writers and Publishers), and *Printers Ink* have been granted permission to reprint the article, "The Phrase Rule," by Edward L. Gordy, which appeared in the November CHEMIST.

Communications

Early New York Consultant

To the Editor:

I note in the Dec. 1960 CHEMIST that Dr. Truesdail writes of "Independent Laboratories . . ."

I have noted in the N. Y. Public Directory of 1848 that my grandfather, Francis Anton Schleicher, 120 Fulton St., New York City, was the only consulting chemist at that time.

A graduate of Kaiser Wilhelm IV and Bonn, he had several degrees and some (little) practical experience. He was a consulting chemist until about 1865, when he managed the J. K. Wright Printing Ink Co. of Philadelphia.

I have heard he was the only consulting chemist in New York City for several years, and Chas. Pfizer, Zinsser, Power Rosengarten & Co., and others were his customers. I know he led a prosperous and happy life until 1895. My father took over his job at the W. D. Wilson Printing Ink Co. in 1886.

—F. Grant Schleicher, M.Sc., F.A.I.C.
Flushing 54, *N. Y.*

When and Where Do Chemists Work

To the Editor:

THE CHEMIST (December, 1960) presents a most timely report, given by Dr. J. F. Abere, F.A.I.C., concerning "How Do Chemists Work." This report certainly reveals a downtrend in the management of our industrial chemical laboratories for which chemists and chemical engineers are hired. By downtrend, I mean that chemists and engineers should be hired to do good work of a chemical or engineering, creative nature, as well as for other functions—and here we read that only about one third of the industrial chemist's time (or chemical engineer's) is actually spent in the laboratory or at the bench.

We know that chemistry and physics, as all the natural sciences, are actually laboratory sciences; that is where basic research or applied research, as well as routine testing, is carried out, with or without fluorescent lighting.

The present situation of having professional people work only some 33% of their time at the bench is indeed the result of conformity or fear on the part of management or plain waste of talent and manpower. One can note in so many laboratories, usually those of middle size or of large companies, a tendency of cluttering around some chap's desk or idling and gossiping in hall-ways, or libraries, with the adjacent laboratories exceedingly polished looking and already well cleaned up early in the afternoons. One really wonders where work is being done or when.

Besides "writing, thinking and communications" mentioned by Dr.

Abere, hall-cluttering and desk-gathering is the vogue. A creative, alert chemist or chemical engineer needs no time to sit at a desk to "think." That process goes on, in the main, in his mind right in the laboratory where he should "feel at home," if he knows his subject. Time, of course, is needed for literature searches and reports. The writer knows from experience that 80%, not 33%, of the time can and should be covered in the laboratory itself, with one day out of a five-day week spent at the desk . . .

—Edwin J. Barth, P.E., F.A.I.C.
New York 24, *N. Y.*

Thank You. We Agree.

To the Editor:

After reading, "What is $100 Worth Today?", in the December CHEMIST, I came to the conclusion that there is a grave misunderstanding in regard to the attitude of student medalists who did not respond to the essay contest. I am not attempting to make excuses for myself and fellow students, but only trying to point out a few facts which, I hope, will alter your opinion of us.

I, too, was a recipient of an AIC Student Medal and am quite proud of it. When I received the letter of congratulations with an offer to enter the contest, I had every intention of writing an essay. However, I did not fully realize what the next few months held in store for me. Graduate record examinations, comprehensive tests in my major field, and an undergraduate honors thesis, along with the excitement of graduation, made it, virtually, impossible for me to think of an essay contest. You will, most probably, agree with me up to this point, but will add that I had three full summer months to complete the essay.

Whether the new graduate with a diploma in hand had planned to attend graduate school, or whether he was launching on a career in industry, the summer became an intermediate period between two worlds, a period of adjustment. Those who were furthering their education were busy completing applications, visiting their graduate school departments, making arrangements for living quarters, and trying to brush up on the few facts they were positive would be in the preliminary graduate entrance examinations.

On the other hand, those entering the professional world of the industrial chemist or engineer were beset with other problems. Getting acquainted with a new position and an atmosphere completely different from school, to which they were accustomed for the past 16 years, is a task in itself. How could one concentrate on writing an essay at this point when he is attempting, in his free moments, to grasp the research problem he is about to undertake and for which he is responsible?

Therefore, it was not, as your editorial inferred, because we were uninterested in a "mere $100" that kept us from submitting essays. Rather, it was because the actual goals, far more important to our future as scientists, took precedence over an essay describing the career we have chosen.

You will, furthermore, agree with me that it has been more difficult in the past few years to keep up with the progress of science, and more is expected of the student today than ever before. Perhaps those who entered the contest in the past did not have to contend with the pressures surrounding the young scientist of 1960.

—Barbara I. D'Iorio, A.A.I.C.
Philadelphia 38, Pa.

The Real Reason

To the Editor:

I read with interest the editorial, "What is $100 Worth Today?", appearing in the December, 1960, CHEMIST. I, too, feel aggrieved that the student medalists did not participate in the Essay Contest. Since I am one of them, I would like to tender, if not a defense, at least an excuse for this ubiquitous abstention.

This excuse may be local, but it is not individual, for I know of at least one other medalist in a similar circumstance . . . The banquet, at which the student medalists sponsored by this particular chapter were to be honored, was scheduled to be on the evening of 7 June. This was, however, three days after graduation, and the day on which I began my summer employment at Argonne National Laboratory. I was assured that the award would be mailed to me at my summer address by my sponsoring faculty member. Due to circumstances, however, I did not receive the award until the last week in August. This was the first time that I learned of the Essay Contest.

The idea of expressing my opinions about my profession was exciting, for I feel strongly about what this profession should be and what it is. For example, I would be more emphatic than Mr. Crippen, in his editorial, "Professional Standing is Also an Attitude of Mind," which appeared in the same issue of THE CHEMIST, by stating that the professional chemist, especially the one with the Ph.D. degree, is in stature above that of the physician or lawyer. The professional chemist is not working for himself; is not working for those individuals who become his clients, but is working for the improvement and advancement of society as a whole. Further, this society is not limited by the bounds of the community, the state, or the nation. In this light, the professional chemist is not one of the masses, but an individual who can contribute significantly in his own way to the furtherance of science and society.

By late August, the preliminary exams given by the graduate school in chemistry were becoming increas-

ingly imminent. I did not feel that I could adequately prepare for these exams and also prepare an acceptable manuscript in the two weeks that remained. Which I felt was more important at that time is now past history.

I feel, however, that any professional chemist should and would be delighted to prepare an essay concerning his own profession, irrespective of any monetary inducements. I think that judgment concerning this year's student medalists should not be made on the basis of the depreciating dollar.

—Arnold J. Krubsack
Madison 3, Wisconsin

Editor's Note: Thank you for enlightening us.

Thoughts on the November Editorial

To the Editor:

The article "Patent Ownership in Government Sponsored Research" (p. 393, Nov. CHEMIST) was interesting reading, but it overlooks a few important facts.

First: On the question "Whose invention is it?" there is a Supreme Court case settling this matter as follows:

> "Whose property was the process and machinery to be when developed? The answer would seem to be inevitable and resistless, of him who engaged the services and paid for them, they being his inducement and compensation" *Standard Parts vs Peck*, 264 *U.S.*52.

Surely if a corporation as employer obtains the property right of inventions made *in futuro* by a contracted inventor employee, why should not the Federal government as employer equally be entitled to the property rights in the inventions made with the aid of a contracted corporation citizen employee or even human citizen employee?

To argue that an employee corporation under government contract is entitled to property rights of the employer Federal Government is to say that in equity, the human inventor employee of a corporation is entitled to the property right in his invention and that the corporation employee obtains a mere license to use. Surely no corporation would hire a chemist for the mere right to use the invention. Then why should the Federal Government hire a corporation or a chemist to do research and development for a mere license to use?

Second, I as a taxpayer through the Federal Government pay the corporation to do the research. Then, when the corporation obtains a patent and licenses it to another corporation, I pay a second time in the price increase of the patented product due to the royalty fee. Surely, while this practice is highly profitable to the corporation, it is a case of "double taxation."

Third, in the struggle to make the world safe for corporations (there are no corporations possible under the communist philosophy of no private property) I would think that the cor-

porations would gladly work for a 7% profit on contract. After all if Russia should win the Cold War in Cuba, etc., or a hot World War Three, no corporation, not even General Motors would survive. Albeit one can't kill a corporation citizen even with a hydrogen bomb, yet if the corporation system can not compete successfully with the no-corporation-as-a-way-of-life system, i.e. communism, would it not follow that corporations would in the end be nationalized?

Accordingly in order to survive in a world of Survival of the Fittest Economic System, it is good business for the corporations to take government defense contracts even at no profit, since the military forces protect our corporation system to a greater degree than our human citizens. Surely in the event of defeat and loss of all our corporation citizens, many human citizens would survive.

—Dr. Frank Makara, F.A.I.C.
New York 7, N. Y.

Lifetime Earnings of a Professional Person

To the Editor:

I agree with the remarks made by Dr. Otto Eisenschiml and Dr. D. B. Keyes (pp. 415 and 416, THE CHEMIST, Nov. 1960.) There is one point which I do not think has been mentioned, namely, the lifetime earnings of a professional person. I believe that there are few professional people who, after taxes at the age of 65, have much more money than a person leaving school at 16, who happens to join the right labor union, will have after taxes. My personal investigations have revealed that this is a very important point and one which those people who call themselves Liberals should consider in their zeal for high taxes on those with superior ability and initiative. I would expect that within a short period there will be a shortage of doctors, dentists, scientists, etc., not for the lack of money for college and graduate school, but for the simple reason that it is not economically desirable.

Also, I would like to comment on the letter by Dr. Frank Makara (p. 416), specifically with reference to paragraph 3, column 2. It is not possible, nor desirable, to make industry do basic research by compulsion, but it can be readily done by a sensible and simple process of making it worthwhile to do so. To state the proposition another way, all the government needs to do to encourage basic research is to give tax exemption for money spent for this purpose. Also, while we are on this type of thing, if the government is really interested in the growth of industry, it should cease to penalize the efficient by taxing earnings at the unconscionable high rate of 52 per cent.

—Dr. J. B. Dickey, F.A.I.C.
Kingsport, Tenn.

From the Far East

To the Editor:

Our unit has been a subscriber to THE CHEMIST for about two years now. Being the only chemist in this outfit, I enjoyed reading the articles which are very informative and interesting especially those that pertain to the chemical profession as a whole.

—Federico A. Peralta,
Captain, MAC (AFP)
Quezon City, Philippines

Gift Subscription Appreciated

To Martin B. Williams:

I received a letter from THE CHEMIST . . . which will be sent to me monthly as a gift from you. Already there appeared two publications (June, July) on my desk. I am very glad that I found your name as contributing editor.

In gratitude for your kindness that produces great value, essential to our way of technical life.

—Mototaro Ikeda
Tokyo, Japan

Thoughts on My 83rd Birthday

I have swapped my passions for
pensions
Which greatly eases life's tensions,
But I'd lots rather work
Than so have to shirk
What the Ladies expect in attentions!

—Dr. Jack P. Montgomery,
Hon. AIC
Tuscaloosa, Ala.

Professional Appointments

Jan. 18, 1961. Chicago, Ill. Beaubien Room. Meeting of Chicago Chapter. Speaker, Dr. Otto Eisenschiml, F.A.I.C., Scientific Oil Compounding Co., For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

Jan. 19, 1961. New York, N. Y., The Chemists' Club, 52 E. 41st St. Meeting of the New York Chapter. Speaker, Robert Kampschulte, Vice President, Sales, Celanese Chemical Co., New York, N. Y. Subject, "Marketing." (Part of the theme, "What Every Chemist Should Know about the Chemical Business.)

Jan. 26, 1961. Los Angeles, Calif. Meeting of Western Chapter. Speaker, Dr. Milton Harris, AIC President. For information, Stuart R. Garnett, Chairman Western Chapter, 506 W. Almond St., Compton 4, Calif.

Jan. 31, 1961. Minneapolis, Minn. (Place to be announced). Meeting of Twin City Chapter. Presentation of Honor Scroll to Victor Kohn, science writer on the staff of the *Minneapolis Tribune*. AIC President Milton Harris will speak. For information, Miss Virginia Carletta, secretary of the Chapter, 357 Hope St., St. Paul 6, Minn.

Feb. 2, 1961. Philadelphia, Pa. Penn-Sherwood Hotel, 3900 Chestnut St. Honor Scroll Award meeting of Philadelphia Chapter. Recipient: Dr. Charles C. Price, F.A.I.C., of the University of Pennsylvania. Address: "The Story of Polyether Rubber." Reception 6:30 p.m. Dinner 7:15 p.m. Address 8:30 p.m. For reservations: Dr. C. K. Deischer, Harrisson Lab., 34th St. & Spruce, Philadelphia, Pa. (EVergreen 6-0100, Ext. 8317) before Jan. 25.

Feb. 9, 1961. New York, N. Y. The Chemists' Club, 52 E. 41st St. Meeting of AIC National Council and Board of Directors. Council meets at 6:00 p.m. Board at 5:30 p.m.

Feb. 10, 1961. New York, N. Y. Place to be announced. Joint AIC-ACS meeting under the auspices of the ACS. Subject and speakers to be announced.

Feb. 14, 1961. Buffalo, N. Y. University of Buffalo, Norton Hall. Meeting of Niagara Chapter. Speaker: Dr. Edward

Buehler, Department of Geology and Geography, The University of Buffalo. Subject: "The Geology of the Niagara Frontier." Dinner 6:30. For reservations: Prof. Howard W. Post, Secretary of the Chapter Chemistry Dept., University of Buffalo, Buffalo 14, N. Y.

Feb. 15, 1961, Chicago, Ill. Beaubien Room. Meeting of Chicago Chapter. Speaker, Dr. A. C. Ivy of the University of Illinois. For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

Feb. 16, 1961. Watertown, N. Y. Hotel Woodruff. Dinner meeting, Beaver Falls Chapter. Social hour 6:30 p.m. Speaker: Dr. Johan Bjorksten, President, Bjorksten Research Labs., Madison, Wis. Subject: "Aging and Its Professional Implications." Ladies Invited. For information: Carlton Force, Latex Fiber Industries, Beaver Falls, N. Y.

Mar. 8, 1961. Chicago, Ill. Builders Club. Joint meeting of Chicago Chapter with AIChE. For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

Mar. 14, 1961. Minneapolis, Minn. (Place to be announced) Joint meeting of Twin City Chapter with Minnesota Section ACS, Twin City Section of AIChE, and the Minnesota Industrial Chemists Forum. For information: Dr. H. L. Weisbecker, 2138 Berkeley Ave., St. Paul, Minn.

Apr. 4, 1961. Niagara Falls, N. Y. Meeting of Niagara Chapter. Place, subject and speaker to be announced. For information, Prof. Howard W. Post, Secretary of the Chapter, Chemistry Department, University of Buffalo, Buffalo 14, N. Y.

Apr. 6, 1961. Philadelphia, Pa. Luncheon meeting of Philadelphia Chapter. For information, Dr. Ezra Bitcover, Secretary of the Chapter, c/o U. S. Department of Agriculture, Eastern Utilization Research Div., Philadelphia 18, Pa.

Apr. 13, 1961. Watertown, N. Y. Hotel Woodruff. Social hour 6:30 p.m. Dinner 7:30 p.m. Meeting of Beaver Falls Chapter with TAPPI. Speaker, Dr. K. A. Arnold, T.D., St. Regis Paper Co., New York, N. Y. Subject: "The Planning of a Technical Center." For information: Carlton Force, Latex Fiber Industries, Beaver Falls, N. Y.

Apr. 19, 1961. Chicago, Ill. Beaubien Room. Meeting of Chicago Chapter. Speaker, Dr. E. J. Sparling of Roosevelt University. For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

April 20, 1961. New York, N. Y. Place to be announced. Meeting of New York Chapter. Presentation of Honorary AIC Membership to Dr. Lloyd Van Doren, retired AIC Secretary. Subject of discussion, "Chemical Patent Procedure."

May 4, 1961. Paoli, Pa. Paoli Inn. Student Honor Award Meeting of Philadelphia Chapter. Topic and Speaker to be announced. For information: Dr. Ezra H. Bitcover, Chapter Secretary, U. S. Dept. of Agriculture, Eastern Utilization Research Div., Philadelphia 18, Pa.

May 11-12, 1961. Washington, D.C. Statler Hotel, 38th Annual AIC Meeting. The Washington Chapter will be our host.

May 12, 1961. Minneapolis, Minn. (Place to be announced) Meeting of Twin City Chapter. Presentation of student medals. For information: Dr. H. L. Weisbecker, 2138 Berkeley Ave., St. Paul, Minn.

May 17, 1961. Chicago, Ill. Beaubien Room. Meeting of Chicago Chapter. Speaker, Dr. Gerald Gordon, E. I. du-Pont de Nemours & Co. For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

May 25, 1961. New York, N. Y. Place to be announced. Presentation of the Honor Scroll of the New York Chapter. Honoree and details to be announced.

June 6, 1961. Niagara Falls, N. Y. Meeting of Niagara Chapter. Student medals will be presented. Place, subject and speaker to be announced. For information, Prof. Howard W. Post, Secretary of the Chapter, Chemistry Department, University of Buffalo, Buffalo 14, N. Y.

June 21, 1961. Chicago, Ill. Beaubien Room. Meeting of Chicago Chapter. Speaker, Dr. A. Allan Bates, Portland Cement Association. For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

Intelligence Information

(A condensation of *Industrial Security Letter* 60-5, issued by the Department of Defense on 15 Sept. 1960. Copies of the complete letter may be obtained from R. L. Applegate, Staff Director, Security Programs Division, Office of Security Policy, Office of the Assistant Secretary of Defense, Washington 25, D.C.)

EXPERTS in Sino-Soviet Bloc intelligence have estimated that the Soviet Military Attaché office in the United States obtains approximately 95 per cent of its intelligence information from open, public sources. The Soviet Bloc has more than 700 assigned as officials to its embassies, consulates and delegations in this country. It is estimated that 70-80 per cent of them are occupied primarily with obtaining information about the United States as contained in publicly available books, magazines, pamphlets, newspapers, motion pictures, reports, brochures, etc. Being able to secure material legally and so easily eliminates the hazardous and time- and personnel- consuming clandestine operations which would otherwise be necessary.

In recent months the numbers and types of questionnaires being circulated throughout industry have increased considerably. The Department of Defense, in an *Industrial Security Letter* issued on September 15, 1960, has cautioned that no classified information can be released in answer to questionnaires. There is also some concern with regard to the fact that certain compilations of information which is unclassified could have an adverse effect upon our national security. Often the information requested on a questionnaire is available from unclassified publications. The questionnaire, however, may not only elicit the factual data available from such publications but also seeks subjective, qualitative analyses of the facts. The use of questionnaires is considered to be an excellent device to attempt to elicit the unwitting disclosure of classified information. The exercise of good common sense and good judgment and the maintenance of a conservative outlook toward the handling of questionnaires is urged.

The Sino-Soviet Bloc intelligence apparatus is also engaged in an overt attempt to obtain unclassified information of strategic and technical intelligence value from United States industry. This is done through correspondence to industry requesting information in various forms, such as brochures, catalogs, books, production charts, layouts, technical and research reports, photographs, etc.

The letter contains a list of all of the agents registered with the Department of Justice as representatives of principals within the Sino-Soviet Bloc countries, which can be used as a check in questioning the source of requests for information.

On the Unionization of Professionals

(Excerpts from an abstract of a talk given by L. C. Kemp, Jr., vice president, research, Texaco, Inc., 135 E. 42nd St., New York 17, N. Y., at the Midyear Conference of the Manufacturing Chemists' Association, Inc., in New York, N. Y., Nov. 22, 1960.)

SOME of the factors involved in the professional development of scientists and engineers are of particular interest from the management point of view. Our thoughts are directed to the area of what is generally referred to as "professional unionism" but what, for clarity, might better be designated as the "unionization of professionals."

In the chemically oriented industries we are inclined to be a little smug about the fact that we do not work our scientists and engineers under conditions which we regard as conducive to unionization. We do not as a rule, as is frequently the case in the aircraft and electronics industries, have large teams of professional people employed on rather limited objective projects in such a way that the contributions of the individual scientist or engineer and even his identity are completely obscured from the administrative people only a level or two above that of his immediate supervisor.

We must, however, take note of two sets of facts: (1) There are substantial blocks of non-supervisory scientific and engineering personnel in our industries that have placed their economic and professional welfare in the hands of some sort of collective action group. (2) The leaders of labor unions have taken note of the declining ratio of blue to white collar workers in industry and of the ever-increasing importance of the professional segment of industrial personnel. It is a well-publicized part of labor union strategy to bring as many non-supervisory professional scientists and engineers into union ranks as they can.

The American Institute of Chemical Engineers has devoted much thought to this matter of the unionization of the professionals. In the light of the highly individual nature of the truly professional man's work it can only be concluded that the scientist or engineer has little to gain and could lose much by placing his economic and professional fate in the hands of a collective agency.

However, being against something is hardly enough. Positive and enlightened activity should be undertaken in the best interest of both professional people and the companies by which they are employed . . .

This raises the suggestion that management would be well advised to consider that they are dealing with a highly valuable group of personnel in this area and that neither the general procedures for the administration of supervisory personnel nor those for labor are apt to produce the most

effective operation of technical people. Certain policies and procedures designed specifically for the administration of personnel in technical activities would appear to be well justified.

In a more specific vein the following are some of the things that alert managements have found helpful in this area:

(1) The establishment of titles which clearly differentiate the professional scientist and engineer from the sub-professional personnel in the organization.

(2) The provision of lines of advancement based on technical competence in addition to the avenues of promotion in supervisory positions.

(3) The provision of adequate tools and facilities for the conduct of professional work. Adequate stenographic and clerical assistance, for example, tend to minimize the amount of professional manhours diverted to nonproductive effort.

(4) The encouragement of professional development through the study of current technical literature; the participation in technical society activities, including attendance at technical meetings, and, where practical and appropriate, attendance at advanced university courses.

(5) The emphasis by management of the individual nature of professional work and of the importance attached to the professional contributions made by individuals to the success of the enterprise.

(6) The suitable recognition, preferably of an appropriate public nature, of outstanding individual accomplishments.

In summary, it is believed evident that our scientific and engineering personnel will be subjected, to an increasing extent, to the organizing pressure of unions. It is believed that such collective action is detrimental to the best interests of the individual and to the enterprise in which he is engaged. Much more can be gained by the individual through development as a professional man, and management has a vital stake in fostering this professional development, by means which are reasonable in cost and relatively simple to employ.

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The Professional Men

(Excerpt from a paper presented by Dr. Vannevar Bush, chairman of the board, Merck & Co., Inc., before the Manufacturing Chemists' Association, Inc., Nov. 22, 1960, New York, N. Y.)

EVER since the days of the clan there have been three great groups in society. First, there have been those who labored; they produced the fruits on which the subsistence of the clan depended. Second, there have been those who directed and governed, forming a structure which distinguished the clan from a disorganized mob vulnerable to the vicissitudes of nature and the rapacity of neighbors. Finally, there have been the professional men.

In the days of the clan this last group was represented by the medicine man. He held himself apart and dealt in mystery. He may have victimized his fellows, or aspired to succeed his chief. But, at his best, he served his people in ways that were beyond the needs of the moment.

As society advanced, his place was taken by the professional groups in the population, in religion, in law, in medicine. Today this has ramified into a hundred categories, the architects, the artists, the scientists, the engineers, the management consultants, the teachers at every level, the certified public accountants, in many senses the civil service.

The early professions surrounded themselves with mystery and paraphernalia. They used a special jargon; some still do. They invented passwords, and wore strange and wonderful raiment. They tested neophytes and indoctrinated them in the mysteries. They claimed exclusiveness and special privilege. They created bizarre organizations for their own discipline and regulation. They boasted queer titles.

But the central theme of any true profession is ministry to the people. This is not just a service, humbly rendered. It is guidance, extended with pride and authority. Moreover, there is no vow of poverty, no turning away from the ways of the world. The profession is a part of the society in which it acts. Its members expect, and intend to obtain, a proper share of the world's goods, in order that they may act effectively. But they are far more interested in other things than to join a mad scramble after riches. Their object in life is to minister to the needs and welfare of those about them, by reason of special knowledge and special skills.

To attain this position they expect to spend long, arduous years in special study and experience, to forego in so doing many of the pleasant things of life; if necessary, to endure hardship. When they arrive, they expect to receive the respect of their fellow men which is their due, and they expect to earn a good living for themselves and their children. Their motivation is the esteem of their peers. Some of

them are interested in public acclaim, but not many. Some, of course, are fakes and montebanks, and not true professional men at all.

But, for the genuine professional man, the thing that leads him on, that causes him to exert his best efforts, to aspire to great accomplishment, is the desire to win over the long run respect of those of his fellows whose judgment and whose standards of judgment he respects. If a man's life is devoted to ministry to the people in this sense, and if his reward is the respect of the best of his peers, then he is a professional man. And, as such, he is the cement which has held society together since it first began.

FOR YOUR LIBRARY

Synthesis and Organization of the Bacterial Cell

By E. F. Gale. John Wiley & Sons, Inc. 1959. 110 *pp.* 5" x 7½". $3.50.

This little volume deals with the 1959 Ciba Lectures in Microbial Biochemistry, presented at the Institute of Microbiology, Rutgers University. Synthesis in the bacterial cell and the chemical nature of the cell are discussed. Stressed are experimental results which appeared within the past five years.

—Dr. Henry Tauber, F.A.I.C.

An Introduction to the Organic Chemistry of High Polymers

By Carl S. Marvel, John Wiley & Sons, Inc. 1959. 82 *pp.* 9¼" x 6". $4.50.

Derived from the Humble Lectures on Science, presented by the author at the University of Illinois, this book was written for those just starting research in polymer chemistry. As research professor of organic chemistry at the University, Dr. Marvel brought to this book the experience necessary to make such a presentation. Many young organic chemists have already been interested, by means of this book, in the possibilities inherent in the synthesis of new organic polymers. The volume is easy to read: The author has a clear straight-journal style and the printing is excellent.

—Dr. Frederick A. Hessel, F.A.I.C.

Principles of Unit Operations

By A. Foust, L. Wenzel, C. Clump, L. Maus, L. Anderson. John Wiley & Sons, Inc. 1960. 578 *pp.* 6½" x 11¼". $15.00.

This introductory text offers a welcome clearness of presentation. It emphasizes similarities among various unit operations by use of physical models or mathematical relations or both. Complicated problems are handled by applying the general equations. The work is divided into three parts: Stage Operations, Molecular Transport, and Applications to Equipment Design. Included in the appendices are Model Theory, Equipment Design Data and Physical Data, some of which is not available in standard reference works.

—William M. Dunne

Chemical Books Abroad

By Dr. Rudolph Seiden, F.A.I.C.

Walter de Gruyter & Co., Berlin; *Analytische Trennung und Identifizierung organischer Substanzen,* by O. Neunhoeffer; 1960, 128 pp.; DM 18.—A brief, yet most valuable laboratory book which teaches students and industry chemists how to separate and identify organic compounds.

Georg Thieme, Leipzig: *Kleines medizinisches Fremdwoerterbuch,* by I. and W. E. Goldhahn; 2nd ed.; 136 pp. (210 ill., 9 tables); DM 9.50.—A pocket dictionary of medical terms, useful for those who are interested in the etymology of these terms.

F. A. Brockhaus Verlag, Leipzig: *ABC der Naturwissenschaft und Technik;* 7th ed., 1051 pp. (approx. 2500 ill.); DM 17.50.—Chemistry, physics, mineralogy, geology, mathematics, and other branches of the natural and technical sciences are treated in this encyclopedia of more than 10,000 key words. The articles are well

written, concise, and up-to-date.

Verlag fuer chemische Industrie, H. Ziolkowsky, Augsburg: *Wachs-Enzyklopaedie,* Vol. 2, Part I: *Untersuchung der Wachse und verwandter Warengruppen,* by L. Ivanovszky; 1960, 486 pp.—Describes systematically the methods used for the investigation of waxes, wax products, as well as norms and properties of the waxes.

Ferdinand Enke Verlag, Stuttgart: *Die quantitative Bestimmung der Alkaloide in Drogen und Drogenzubereitungen,* by O. E. Schultz and F. Zymalkowski; 1960, 305 pp.; DM 77.—A treatise on the isolation and quantitative determination of alkaloids, many of which occur in plant material only; with literature references. • *Handbuch der praeparativen anorganischen Chemie,* Vol. 1., by G. Brauer; 2nd ed., 900 pp.; DM 124.—The first of 2 parts of this well-known handbook; it includes discussions of methods for the preparation of compounds of the following elements: H,D,F,Cl,Br, I, O, S, Se, Te, N, P, As, Sb, Bi, C, Si, Ge, Sn; Pb, B, Al, Ga, In, Tl, Be, Mg, Ca, Ba, Sr, Na, K, Li, Rb, and Cs.

Pharmaceutical Press,., London (Distribution: Rittenhouse, Philadelphia, Pa.): *The Pharmaceutical Pocket Book;* 17th ed., 588 pp.; $7.—The pharmaceutical chemists "Bible"—a readable, dependable, yet concise reference work full of facts and figures. They concern such subjects as the British Pharmacopoeia; science for pharmacy; forensic pharmacy; analysis; solubilities; weight and measures, etc. There are also many useful tables, formulations, equivalent data, and glossaries.

The American Vacuum Society is inviting papers for presentation at the Second International Congress on Vacuum Technology to be held Oct. 16-19, 1961, at the Sheraton Park Hotel, Washington, D.C. Deadline for abstracts (and 2-page summary) is April 1. Send them to L. E. Preuss, Program Chairman, Edsel B. Ford Inst., Henry Ford Hospital, Detroit 2, Mich.

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Deutsch & Shea, Inc., New York 36, N. Y., technical manpower consultants, reports that an increase in the competition for engineers and scientists may be underway. The Engineer Scientist Demand Index developed by the firm shows more than 10% increase in demand, measured by the volume of recruitment advertising in 27 newspapers in major market areas and 16 key journals in various technical and scientific fields.

The American Vacuum Society and New York University are sponsoring the 5th Annual Conference on Vacuum Metallurgy, to be held June 26-27, 1961, at University Heights Campus of the University, New York, N. Y.

The National Cotton Council, 1200 - 18th St., N.W., Washington 6, D.C. will hold Chemical Finishing Conferences at the Sheraton Park Hotel, Washington, D.C., on Nov. 8-9, 1961, and on Oct. 3-4, 1962.

The headquarters of the Petrochemicals Department of American Cyanamid Company has been transferred to Bound Brook, N. J.

Professional Material Available

(Free unless otherwise noted)

"Only Constitutional Incentivism Can Keep You Free." By John W. Anderson, The Anderson Co. Reprint of lecture given at Rose Polytechnic Institute, Apr. 21, 1960. Request from National Patent Council, 1434 West 11th Ave., Gary, Ind.

"A Review of Atomic Neutrality and Other Atomic Concepts. Part I." By Orville L. Cain. $4.25 from *The North Sacramento Journal*, 1808 Del Paso Blvd., North Sacramento 15, Calif.

"Air Pollution and Smog," Report of the Air Pollution Foundation, 2556 Mission St., San Marino, Calif. (Query if price).

"Directory of Industrial Research Laboratories in New York State: 1960." Available from New York State Department of Commerce, 112 State St., Albany 7, N. Y.

"Radioisotope Experiments for the Chemistry Curriculum (TID 6374)." Sample copy of manual, which is sponsored by AEC, and set of instructor notes are free to colleges on request to the Director, Office of Isotopes Development, U. S. Atomic Energy Commission, Washington 25, D.C. Copies may be purchased from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D.C., at $2 per copy for the manual and $1 for the instructor notes.

About AIC Members

Dr. J. Frederic Walker, F.A.I.C., author of the ACS Monograph "Formaldehyde" (Reinhold Publishing Corp., 1953) tells us that this book has just been translated into Japanese by Dr. Tamechika Yamamoto, research director, Japan Gas-Chemical Co., Nigata City, Japan, and published by Maki Shoten, Tokyo. Dr. Walker is now working on the third U. S. edition.

Harry M. Zimmerman, F.A.I.C., general manager, Plastics Division, Seiberling Rubber Co., Newcomerstown, Ohio, believes that the American plastics industry, prospering this year despite the economic slowdown, will continue to thrive at a record pace in 1961. "The biggest plastics customer, the auto industry, is consuming its largest volume ever. There are more than 300 plastic components in the 1961 cars. More important, there are 22 pounds of plastic in the new car, replacing 50 pounds of metal."

E. C. Greco, F.A.I.C., senior research chemist, United Gas Corp., Shreveport, La., has been elected president for 1961-62 of the National Association of Corrosion Engineers.

Nicholas M. Molnar, F.A.I.C., president, Fine Organics Inc., Lodi, N. J., has accepted the chairmanship for the annual fund raising campaign for the Boys' Club of Lodi.

A memorial symposium in honor of the late **Dr. Walter J. Murphy,** Hon. AIC, former director of the Applied Publications of the American Chemical Society, was held Nov. 19, at Polytechnic Institute of Brooklyn. Speakers on the topic, "Publications —the Blood Stream of the Scientific World" included **Dr. Richard L. Kenyon,** F.A.I.C., editorial director, ACS Applied Publications, Dr. Ernst Weber, president of Polytechnic, and Preston R. Bassett, chairman of the Board of Trustees of Polytechnic.

Life With Chemistry

Dr. K. S. Konigsbacher, F.A.I.C.

HERE are a few stories submitted by a kindly soul:

Do you know that John Winthrop, Jr., the first Governor of my home state of Connecticut, was probably the first American chemist? What is even more interesting, perhaps, is that one of his proteges leaned toward alchemy. In 1645, the year before he graduated from Harvard, this fellow —his name was Stirk or Starkley— wrote a treatise on alchemy under the title, "Eirenaeus Philalethes." I do not know how good the treatise was, but the title certainly sounds learned!

Another famous man was Count Rumford (Benjamin Thompson). He had a rapid rise, not just because he invented the Rumford baking powder; he also married a rich widow, and later in life married the widow of Lavoisier. He is also the man who may have said, "fear no man and do right; fear all women and don't write." Truly a man of great sagacity.

Quick! Who wrote the first American textbook on chemistry? It was Benjamin Rush, one of the signers of the Declaration of Independence. He wrote the first book on chemistry by an American teacher, while professor at the Philadelphia Medical School.

All this happened in the dark ages, or as children are wont to say, "in the olden days." Are we chemists of today nothing but silent, well-trained technicians, or do we still have among us some who lead more colorful lives? If there are some who have anecdotes to tell, I would like to hear from them. We don't pay as well as *The Readers' Digest,* but they may show a few people that not all of us are eggheads!

Dr. Per K. Frolich, F.A.I.C., retired as deputy chief chemical officer for scientific activities and chief scientist of the Army Chemical Corps, Dec. 31. He will engage in consulting activities. He resides at 9517 Kenneth Drive, Annandale, Virginia.

Dr. Milton J. Allen, F.A.I.C., is now director of chemical research, Electro-Optical Systems, Inc., 125 North Vinedo Ave., Pasadena, Calif. He was formerly with Ciba Pharmaceutical Products, Inc., Summit, N. J.

Samuel B. McFarlane, F.A.I.C., vice president, research & development, Sun Chemical Corp., New York 17, N. Y., announces that **Peter C. Hereld,** F.A.I.C., has been appointed to the newly created position of director of development.

Dr. Eugene McCauliff, F.A.I.C., president Glyco Chemicals Division of Chas. L. Huisking & Co., Inc., New York 17, N. Y., announces that **Samuel Cohen,** M.A.I.C., is now vice president in charge of sales.

Dr. Ray P. Dinsmore, Hon. AIC, vice president, research & development, The Goodyear Tire & Rubber Co., speaking at the 45th Annual Meeting of the Rubber Manufacturers Association, pointed out that natural rubber can be completely replaced by new "stereo" synthetic rubbers, which "have altered the invulnerable position of the natural product . . . It is no longer a question of whether synthetic can be used in place of natural rubber to give adequate quality. The question now is simply one of economics."

Dr. Arthur C. Cope, head of the department of chemistry, Massachusetts Institute of Technology, takes office Jan. 1, as president of the American Chemical Society for 1961. Dr. Karl Folkers, executive director, Fundamental Research, Merck Sharp & Dohme Research Labs., is the new ACS president-elect.

Dr. Lawrence T. Eby, F.A.I.C., assistant manager, Market Development Division, Enjay Chemical Company, Elizabeth, N. J., is chairman-elect for 1961 of the North Jersey Section of the American Chemical Society.

Dr. Joel O. Hougen, F.A.I.C., of the Research & Engineering Division, Monsanto Chemical Co., St. Louis, Mo., delivered the 12th Annual Institute Lecture of the AIChE, at its 53rd annual meeting. His subject was "Process Dynamics: Accomplishments and Prospects."

Marion S. Badollet, F.A.I.C., of 35 Farragut Road, Plainfield, N. J., chief of the Asbestos Fibers Section of the Johns-Manville Research Center in Manville, N. J., retired December 1, after 31 years with the company. He is a contributing author to numerous books and encyclopedias, and an authority on asbestos fiber.

Raymond F. Fremed, F.A.I.C., has joined Burson-Marsteller Associates, 800 Second Ave., New York 17, N. Y., as an account executive, to work on public relations for Metal & Thermit Corp. He was formerly associate editor, engineering practice, of *Chemical Engineering.*

Dr. Roy Powell Whitney, F.A.I.C., vice president, Institute of Paper Chemistry, Appleton, Wis., has been named chairman of the Committee on Paper Base Materials of the National Academy of Sciences—National Research Council.

Carl Setterstrom, F.A.I.C., vice president of marketing, Rexall Chemical Co., division of Rexall Drug & Chemical Co., announces that a regional sales organization for the company's plastics resins has been set up by Rexall. Sales offices have been established in Holyoke, Mass., Beverly Hills, Calif., and Oak Park, Ill.

Dr. Austin B. Wilder, F.A.I.C., of E. I. du Pont de Nemours & Co., Chicago, Ill., has been transferred by the Company to its Petroleum Laboratories, P.O. Box 1671, Wilmington 99, Del.

Dr. Marion B. Geiger, F.A.I.C., has been appointed director of international development of Hooker Chemical Corporation, New York, N. Y.

Dr. Johan Bjorksten, F.A.I.C., announces that Bjorksten Research Laboratories of Madison, Wis., and Houston, Texas, have extended their laboratory services to include custom organic syntheses.

Dr. Herman F. Mark, F.A.I.C., of Polytechnic Institute of Brooklyn, Brooklyn, N. Y., was awarded an honorary degree in natural sciences, in December, from the Polytechnic Institute of Munich.

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Dr. William H. Bowman, F.A.I.C., has been appointed a vice president of American Cyanamid Co., New York 20, N. Y. He will report to **Kenneth H. Klipstein,** F.A.I.C., executive vice president.

Dr. Frederick W. Sawyer, F.A.I.C., vice president, Jacobs Engineering Co., Pasadena, Calif., announces that the company will engineer and construct a $7 million plant for Metal Climax, Inc., Southwest Potash Division, at Vicksburg, Miss., to produce nitrate of potash.

Dr. Kenneth W. Newman, F.A.I.C., general manager, Isotopes Specialties Co., div. of Nuclear Corp. of America, Burbank, Calif., is the new chairman-elect of the Southern California section of the American Chemical Society.

Crawford Greenewalt, Hon. AIC, president, E. I. du Pont de Nemours & Co., is the author of "Hummingbirds" (Doubleday & Co.), a beautifully illustrated volume prepared for the American Museum of Natural History.

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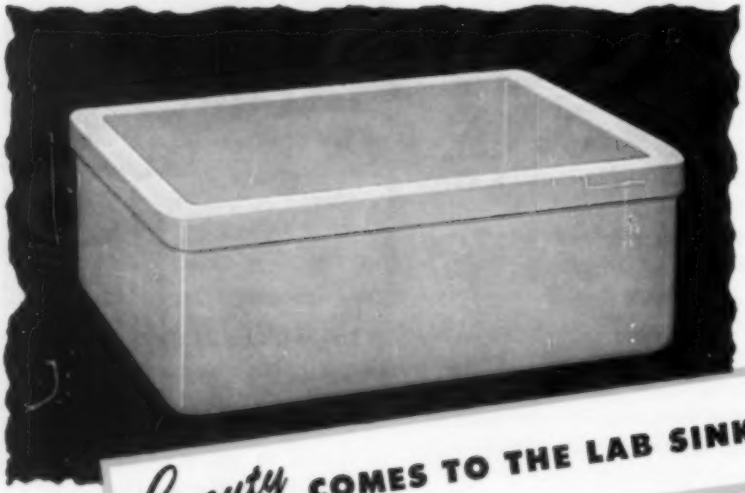

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